Welcome

Helmholtz Association
Moscow
Hermann von Helmholtz – his research is our mission

- Commitment to interdisciplinary research
- A sense for the practical: Contribution to creating wealth
- Founding President of the Physikalisch-Technische Reichsanstalt: Effective management of large-scale research

Hermann von Helmholtz
(1821 – 1894)
Helmholtz Research Mission & Strategy

- Systems solutions for grand challenges based on:
  - Scientific excellence
  - Interdisciplinarity and critical mass
  - Long term research programs
- Helmholtz provides a highly attractive environment for talents and brilliant brains
- Profound expertise in large scale research infrastructure
- Helmholtz as a prime strategic partner at the local, national and international level
- Transfer of knowledge into economy and society
Helmholtz Research Centers

1. Berlin
   Helmholtz-Zentrum Berlin für Materialien und Energie (HZB)
2. Berlin-Buch
   Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC)
3. Brunswick
   Helmholtz Center for Infection Research (HZI)
4. Bremerhaven
   Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (AWI)
5. Bonn
   German Center for Neurodegenerative Diseases (DZNE)
6. Darmstadt
   GSI Helmholtz Center for Heavy Ion Research
7. Dresden
   Helmholtz Center Dresden Rossendorf (HZDR)
8. Garching
   Max Planck Institute for Plasma Physics (IPP) (Associate Member)
9. Geesthacht
   Helmholtz Center Geesthacht
   Center for Material and Coastal Research (HZG)
10. Hamburg
    Deutsches Elektronen-Synchrotron DESY
11. Heidelberg
    German Cancer Research Center (DKFZ)
12. Jülich
    Forschungszentrum Jülich
13. Karlsruhe
    Karlsruhe Institute of Technology (KIT)
14. Kiel
    GEOMAR Helmholtz Center for Ocean Research Kiel
15. Cologne
    German Aerospace Center (DLR)
16. Leipzig
    Helmholtz Center for Environmental Research (UFZ)
17. Munich
    Helmholtz Center Munich – German Research Center for Health and the Environment
18. Potsdam
    Helmholtz Center Potsdam
    German Research Center for Geosciences GFZ
19. Saarbrücken
    Helmholtz Center for Information Security – CISPA

Research Areas:
- Energy
- Earth and Environment
- Health
- Aeronautics, Space and Transport
- Matter
- Key Technologies
Facts and Figures
Personnel and Students & Budget 2018

- **39,255 Employees (as of June 2018)**
  - Scientists 37%
  - Trainees 4%
  - Other Scientific Personnel 8%
  - Infrastructure Personnel 38%
  - Doctoral Students 13%

- **€ 4.56 billion (As of Juli 2018)**
  - Third-party funding** 29% (€ 1.29 billion)
  - Special financing 5% (€ 0.25 billion)
  - Budget approach
    - Institutional through the federal government (90%)
    - the federal states (10%)

* As of 2016, the German federal government alone is financing the pact increase so that the federal government's share is over 90%.
** Including project sponsorships
The six Research Fields
of the Helmholtz Association
Program-oriented Funding (PoF)

- Research activities in our 19 centers are organized in long-term programs, pooling the unique research competences of centers in a complementary approach to jointly tackle long-term challenges with a strategic focus.

- They are periodically reviewed by international experts:
  1. scientific assessment of centers & programs
  2. future positioning of our research fields

- PoF provides the financial, strategic and scientific framework for coherent multi-year research programs within each research field.
Program-oriented Funding (PoF)

Key steps

- **Strategic planning process** based on the criteria of
  - achieving a global leadership position,
  - covering a spectrum of innovation from basic research, R & D to applications and vice versa

- **Scientific evaluation** of the centers and programs

- **Research policy objectives** of the federal and state ministries for the strategic positioning of the research field and proposals for new research programs.

- **Strategic evaluation** of each research field and programs

- **Recommendations** of the senate for implementation and funding of the new programs
Research Field
Energy
Research Field
Energy

- Materials & Technologies for the Energy Transition
- Energy Systems Integration
- Nuclear Fusion
- Nuclear waste management
- R&D along the entire value chain: from fundamental research to the market
Research Field
Earth and Environment
Research Field
Earth and Environment

- Preservation and sustainable development of the natural foundations of human life and our environment
- Integrated exploration of the planet and its land, oceans, and polar regions
  - Causes and effects of global change
  - Sustainable use of resources
  - Causes and risks of natural hazards
  - Dynamics of various ecosystems
Research Field
Health
Research Field
Health

- Basic research on disease mechanisms
- Decoding complex systems
- Translational research
- Focus on widespread diseases
- Major challenges:
  - Preventive medicine
  - Personalized medicine
  - Proof of concept
  - E-Health & Big Data
Research Field
Aeronautics, Space and Transport
Research Field
Aeronautics, Space and Transport

- Understanding climate change using earth observation technologies
- Investigating the physics and chemistry of the global atmosphere
- Developing and bringing future technologies for mobility, communication, and security to market
- Data analysis and interpretation as a decisive catalyst
- Getting society involved
Research Field
Matter
Research Field
Matter

- Decoding the structure and function of matter - from researching the quantum universe to designing new materials and active substances
- Scientific portfolio comprises elementary particle, astroparticle, hadron and nuclear physics as well as solid-state, nuclear, plasma, molecular physics and biophysics.
- Forming the basis of unique research infrastructures that require extensive system competence
Research Field Matter
Example: Developing and operating large-scale devices

- European XFEL: Powerful light source
- FLASH pilot facility (for VUV X-rays)
- PETRA III: Most brilliant synchrotron radiation source in the world
- FAIR: Antiproton and Ion Research
- The first point of contact for LHC at CERN: Elementary particle physics
- Exotic nuclei (Bk, Np, Am isotopes)
Research Field
Key Technologies
Research Field
Key Technologies

- Information technologies
  - Super Computer (JUQUEEN/JUROPA)
  - Nanotechnology
  - Big Data analyses

- Material Sciences
  - Nanoelectronics
  - Lightweight construction materials

- Life Sciences
  - Bioeconomy, biomedicine
  - Brain research, Alzheimer's
  - Regenerative medicine
Helmholtz International
Helmholtz Association
Helmholtz International

Helmholtz Association: Foreign scientists and visiting researchers

As of: 2017
Helmholtz International
Offices abroad

- 4 offices of the Helmholtz Association abroad to support international projects:
  - Brussels
  - Moscow
  - Tel Aviv
  - Peking
## Helmholtz International

**German – Russian Mega-Science**

<table>
<thead>
<tr>
<th>International project</th>
<th>German Partner</th>
<th>Russian Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>XFEL</td>
<td>DESY (host)</td>
<td>NRC Kurchatov Institute</td>
</tr>
<tr>
<td>FAIR</td>
<td>GSI (host)</td>
<td>Rosatom, ITEP</td>
</tr>
<tr>
<td>NICA</td>
<td>GSI</td>
<td>JINR (host)</td>
</tr>
<tr>
<td>PIK</td>
<td>FZ Jülich</td>
<td>NRC Kurchatov Institute (host)</td>
</tr>
</tbody>
</table>
Helmholtz International

Funding programs for joint projects

- Helmholtz – Russian Science Foundation, 18 projects: 2017-2019
- Next funding program planned for 2020
HELMHOLTZ-WINTERGESPRÄCHE

- Annual event since 2016
- A strategic platform for exchanging opinions
- German and Russian representatives from science, education and politics
- Every year a new topic
- Under the patronage of Mrs. Edelgard Bulmahn, Vice-President of the German Bundestag and Prof. Andrei Fursenko, Aid to the President of the Russian Federation for Science

- Next date: 06. Feb. 2020, Moscow, Main topic – Climate Research
Helmholtz office Moscow

Elena Eremenko, Head of the office
Malaya Pirogovskaya 5, room 24
Tel.: +7 495 981 17 63
www.helmholtz.ru
Moscow@helmholtz.de

Yulia Gurkina, Assistant

Aleksei Shipilov, PR and Project coordination
Thank you for your attention